CHAPTER 1

1.0 PURPOSE OF AND NEED FOR ACTION

The Tennessee Valley Authority (TVA) owns and operates a system of transmission lines that move electricity throughout the TVA service area and to adjacent utilities. TVA's service area comprises most of Tennessee and portions of six adjacent states. Electric loads on portions of this system in the Murfreesboro, Franklin, and surrounding areas of Middle Tennessee have grown at a rate of 3.5 percent per year since 1990 and are projected to exceed the capacity of the three 500-kilovolt (kV) substations that serve the area by 2010. This load growth will also exceed the capability of several 161-kV transmission lines serving this area by 2010. Therefore, TVA needs to increase transmission capacity into this area in order to be able to continue to provide reliable service.

1.1. Background

The TVA transmission system currently consists of about 17,000 miles of transmission line that connect TVA-owned generating facilities to a total of 1,015 wholesale delivery points and points of interconnection with neighboring power systems. The system also provides transmission services to several recently constructed generating facilities operated by independent power producers. The system serves an 80,000-square-mile area that includes portions of seven states.

The TVA transmission system operates at several different voltages. The highest voltage lines, operating at 500,000 volts (500-kV), are used to move large quantities of electricity over long distances. TVA operates 2,480 miles of 500-kV lines connecting its large generating facilities, 500-kV substations, and some interconnection points with neighboring power systems. At the 500-kV substations, the voltage is reduced, most commonly to 161-kV, for transmission over shorter distances to delivery points or lower voltage substations.

Since 1990, the population in Murfreesboro, Franklin, and surrounding areas of Middle Tennessee has grown at a rate of 4.3 percent per year. TVA supplies bulk electricity to this area through its Davidson, Pinhook, and Wilson 500-kV substations. Because of the rapid population growth the TVA electrical system in the area is expected to exceed the capacity by 2010. Unless action is taken to address these problems, TVA's ability to continue to provide reliable electric service will be undermined, and service to entities and persons who rely on TVA electric power will be degraded and disrupted more frequently and for longer periods. The overall project area is shown in Figure 1-1.

TVA has studied these problems and concluded that the best method of remedying them is either to construct a new 500-kV substation or expand an existing 500-kV substation. Construction of a new 500-kV substation would require, depending on its location, the construction and operation of new 500-kV and 161-kV transmission lines or extensive upgrades to existing 161-kV transmission lines. With the expansion of an existing 500-kV substation, extensive upgrades to existing 161-kV transmission lines and a shorter amount of new 500-kV transmission line would also be required. After presenting these potential solutions at a July 11, 2005, public meeting that identified three possible senarios, TVA tentatively concluded that the Rutherford solution that utilized both 500-kV and 161-kV vacant, TVA-owned right-of-way (ROW) with a lesser amount of new 161-kV ROW would provide the best location for the identified method.

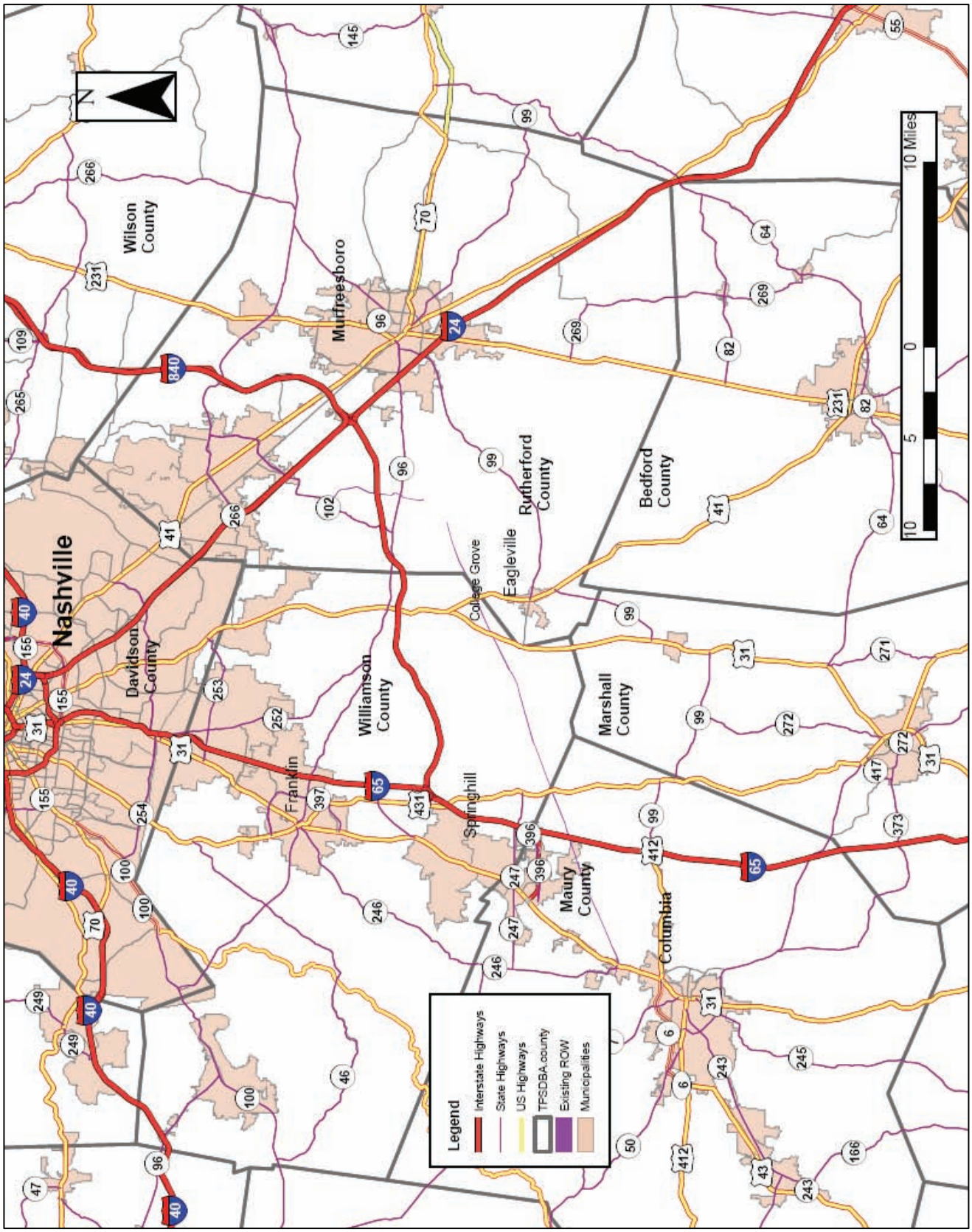

Figure 1-1. Map of the Proposed Rutherford-Williamson-Davidson Power Supply Improvement Project Area

1.2. Proposed Action

TVA's proposed action is to construct and operate a new Rutherford 500-kV Substation, a 500-kV transmission line to this substation, and 161-kV transmission lines from this substation to nearby existing 161-kV substations (Figure 1-2). TVA proposes to use approximately 27 miles of the vacant, TVA-owned Maury-Hartsville Transmission Line ROW between the existing Maury Substation and leading to a new 53.1-acre Rutherford 500-kV Substation. Most of this ROW would be 175 feet wide. TVA also proposes to build two 161-kV transmission lines between the new Rutherford Substation and the nearby existing Almaville and Christiana 161-kV substations. The Almaville 161-kV Transmission Line would be built on approximately 6 miles of vacant, TVA-owned, 100-foot-wide ROW. In addition, TVA would build approximately 3 miles of new 161-kV transmission line with an 85-foot-wide ROW from the Rutherford 500-kV Substation to the Almaville Transmission Line that would partially parallel the existing Murfreesboro-Triune-East Franklin 161-kV Transmission Line. The Rutherford-Christiana 161-kV Transmission Line would be built on approximately 15 miles of new 100-foot-wide ROW.

This project is planned to be built in stages over the next two to three years with a completion date of spring 2010.

Additional activities would be required within the existing substation switchyards, including the construction of new line breaker bays and the installation of breakers and their associated control and communication equipment. Also, a new 500-kV switching station would be required at some time in the future.

1.3. The Decision

The primary decision before TVA is whether to address the projected lack of electrical transmission system capacity by constructing, operating, and maintaining the following:

- A new 500-kV substation in southwest Rutherford County
- A 500-kV transmission line from the existing Maury Substation to the new 500-kV substation
- A 161-kV transmission line from the new 500-kV substation to the existing Christiana 161-kV Substation
- A 161-kV transmission line from the new 500-kV substation to the existing Almaville 161-kV Substation
- A 161-kV transmission line that would connect the existing Murfreesboro-Triune-East Franklin 161-kV Transmission Line to the new 500-kV substation (Figure 1-2)

If these facilities are built, other secondary decisions are involved. These include the following considerations:

- The timing of improvements
- The location of the 500-kV substation
- The best routes for the new transmission line ROWs
- Determining any necessary mitigation and/or monitoring measures to implement to meet TVA standards and minimize potential damage to resources

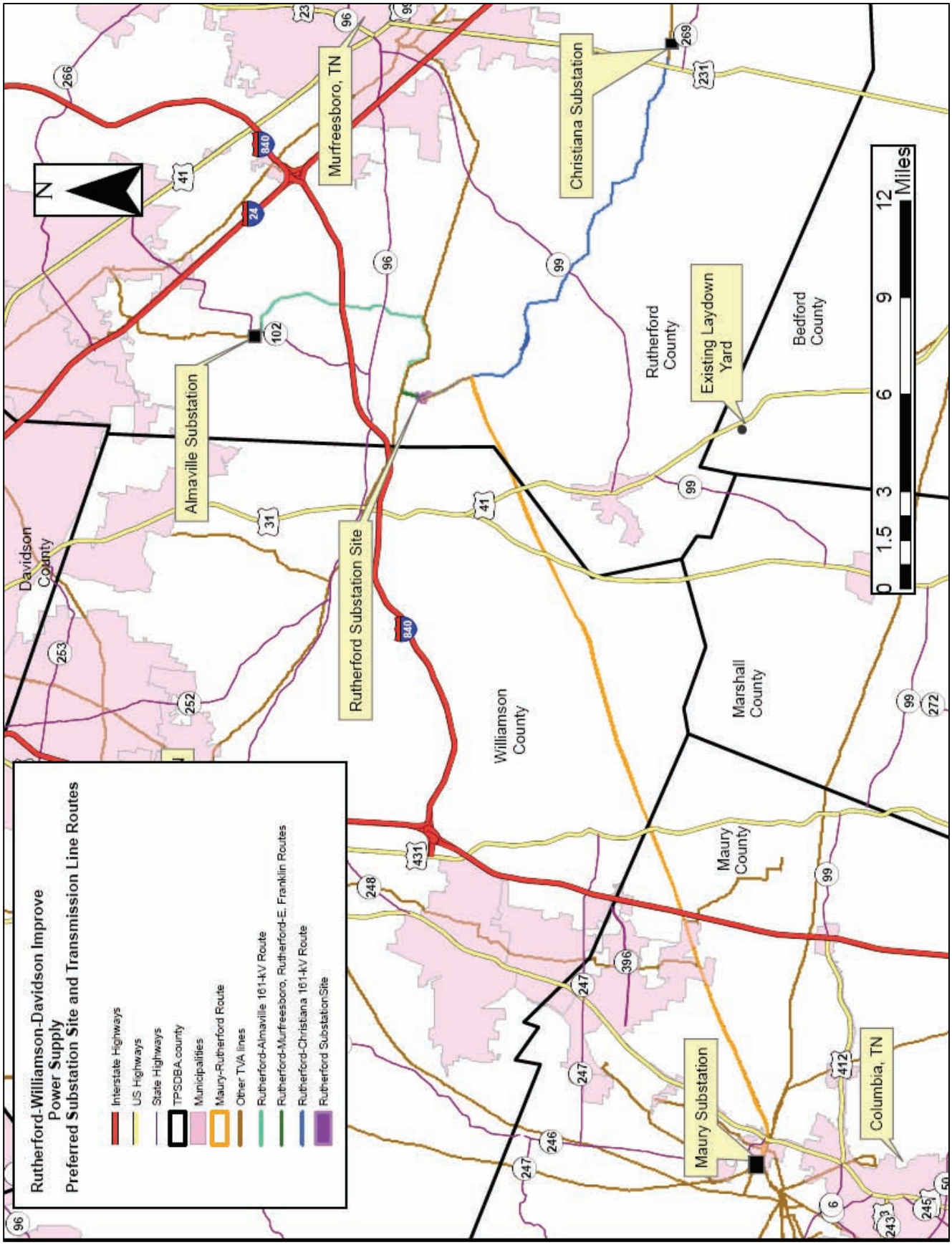

Figure 1-2. Map of the Proposed Rutherford 500-kV Substation and Associated 500-kV and 161-kV Transmission Lines

Depending on the location of the substation and transmission lines, other agencies may also have to decide whether to grant TVA easements or licenses for transmission lines or access roads on properties under their control or whether to issue necessary permits. More information about review and consultation requirements is presented in Section 1.7.

Because of the present risks to the transmission system coupled with the accelerating growth in demand in the Middle Tennessee area, the proposed substation and transmission lines are needed as soon as possible. The earliest achievable in-service date is May 3, 2010. If the proposed substation and transmission line are delayed past this date, the risks to the system will grow, and the reliability of electric service in the area will be degraded.

1.4. Other Pertinent Environmental Reviews or Documentation

In 1995, TVA completed *Energy Vision 2020: An integrated Resource Plan and Programmatic Environmental Impact Statement.* This study addressed short- and long-term strategies that would enable TVA to meet the needs of its customers for electricity through the year 2020. It includes a description of TVA's transmission system.

An environmental review by TVA (2006), *East Franklin-Triune 161-kV Transmission Line Tap to Clovercroft 161-kV Substation Environmental Assessment,* was completed in November 2006. This assessment addressed the East Franklin-Triune 161-kV Transmission Line presently being built by TVA to serve Middle Tennessee Electric Membership Corporation's (MTEMC) new Clovercroft Substation that is being constructed near Nolensville, Tennessee, in Williamson County. This substation will serve growing residential and commercial loads in the area and will be in service in November 2007. The TVA East Franklin-Triune 161-kV Transmission Line is located near the proposed Rutherford Substation site. This transmission line would eventually be connected to the Rutherford Substation. The two projects are not interdependent, and each is needed whether or not the other is constructed.

A second environmental review (TVA 2007), *Murfreesboro-East Franklin and Pinhook-Radnor 161-kV Transmission Lines Environmental Assessment,* was completed in March 2007. This assessment addressed upgrading the Pinhook-Radnor 161-kV Transmission Line and the East Franklin-Triune 161-kV Transmission Line and the construction of a new Murfreesboro-Triune 161-kV Transmission Line. These actions would create a new Murfreesboro-East Franklin 161-kV Transmission Line that would be in service in 2009. This line is proposed to be looped into the proposed Rutherford Substation sometime in 2010. Each project is needed whether or not the other is constructed, but the connection of the Murfreesboro-East Franklin 161-kV Transmission Line into the Rutherford Substation would improve the reliability of service to Murfreesboro, East Franklin, and Triune.

1.5. Public Involvement

Public participation in determining the scope of this environmental impact statement (EIS) began in July 2005 when TVA published a notice of intent (NOI) in the *Federal Register* (TVA 2005). The NOI (see Appendix A) announced that TVA would prepare the EIS and invited interested parties to comment on its scope. Copies of the NOI were sent to three federal agencies, nine Tennessee state agencies, and one local agency (Table 1-1). Written comments were received from two federal agencies, four state agencies, and one local agency (Appendix B).

Table 1-1. Agencies That Were Sent the Notice of Intent Regarding the Preparation of an Environmental Impact Statement on the Rutherford-Williamson-Davidson Power Supply Improvement Project

Agency	Submitted Comments
U.S. Army Corps of Engineers, Nashville District	Yes
U.S. Department of Interior, Office of Environmental Policy and Compliance	
U.S. Fish and Wildlife Service, Tennessee Field Office	Yes
Tennessee Department of Agriculture	
Tennessee Department of Economic and Community Development	
Tennessee Department of Environment and Conservation, Division of Air Pollution Control	Yes
Tennessee Department of Environment and Conservation, Division of Groundwater Protection	Yes
Tennessee Department of Environment and Conservation, Division of Natural Heritage	
Tennessee Department of Environment and Conservation, Recreational Educational Services	Yes
Tennessee Department of Transportation	
Tennessee Historical Commission	Yes
Tennessee Wildlife Resources Agency	
Greater Nashville Regional Council	Yes

TVA held a public scoping meeting on July 11, 2005, at Eagleville, Tennessee, to present three potential solutions identified as Brentwood, Pinhook, and Rutherford to be considered for this project. This meeting was publicized though notices in local media, by TVA press releases, on the TVA Web site, and in letters to local elected officials. About 25 individuals attended the public meeting. Most of the public meeting attendees were landowners in the project area. Some attendees provided information on the location of natural and constructed features important in the siting process. A few individuals also submitted written comments to TVA. These comments were considered by TVA during the planning process.

Major areas of concern to scoping participants were the desire for more precise information on potential transmission line and substation locations, effects on property values, land use restrictions imposed by transmission line easements, the presence of caves and sinkholes, historic houses and battlefields, and endangered and threatened species. Issues raised by federal and state agencies included wetlands, streams, endangered and threatened species, habitat fragmentation, sensitive ecological sites, invasive species, historic and archaeological resources, recreation, subsurface sewage disposal systems, and public health concerns such as hazardous materials, noise, and occupational safety.

Following this public scoping of the project and additional engineering, environmental, and financial studies, TVA eliminated the alternative solutions involving the expansion of the Pinhook Substation and the new substation near Brentwood from further consideration. The reasons for this change are described in detail in the project scoping document, which may be accessed online at http://www.tva.gov/environment/reports/rutherford/scoping.pdf.

TVA held a public meeting in Eagleville, Tennessee, on April 11, 2006, to present potential substation sites and transmission line route combinations for the Rutherford solution project area (Figure 1-3). Public officials and about 800 potentially affected property owners were specifically invited to the meeting. TVA also invited other interested members of the public through newspaper advertisements and local news outlets. Total public attendance at the meeting was about 240.

During a 30-day public comment period following the open house, TVA accepted public comments on potential substation sites, transmission line routes, and other issues. A toll-free phone number and facsimile number were made available to facilitate comments. The comment period was extended by two weeks to allow for additional comments. Many commenters provided information and land use updates that enhanced TVA's understanding of the substation site and route issues as well as usage constraints. Major areas of concern to the participants were similar to the concerns raised during the initial scoping meeting.

1.6. Issues to be Addressed

Issues to be addressed in the EIS were initially identified through an internal scoping process and listed in the NOI. This list of issues was refined based on comments received during the public scoping. The major issues addressed in this EIS are impacts to:

- Water quality and quantity for both surface water and groundwater including domestic sewage disposal
- Aquatic ecology
- Vegetation
- Wildlife including habitat fragmentation
- Endangered and threatened species and their critical habitats
- Wetlands
- Floodplains
- Managed areas and ecologically significant sites
- Recreation
- Land use including prime farmland
- Visual resources
- Archaeological and historic resources
- Socioeconomics including property values and environmental justice

Impacts related to air quality, hazardous and nonhazardous wastes, noise, and health and safety have been considered but did not require detailed evaluation.

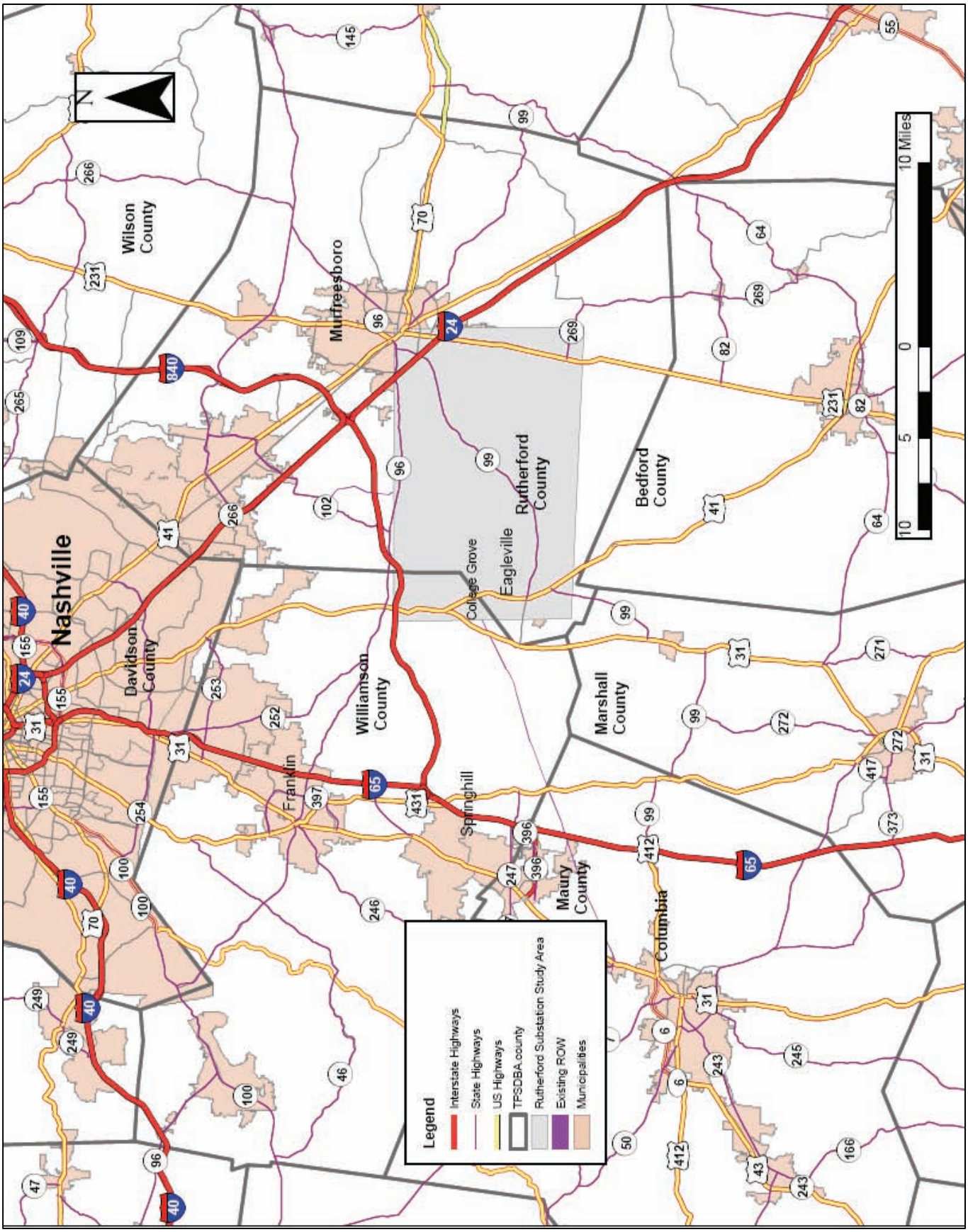

Figure 1-3. Map of the Proposed Rutherford Project Area

1.7. Necessary Permits or Licenses

Several federal, state, and local laws and regulations could apply to one or more of the alternatives considered in this EIS. Compliance with these laws and regulations may require TVA or its contractors to be issued permits or be granted specific approvals. Other applicable permits and approvals are described below, organized by environmental resource area.

Water Quality – TVA would be required to obtain a National Pollutant Discharge Elimination System Storm Water Runoff Permit before site preparation and construction activities can begin. This permit is issued by the State of Tennessee.

Wetlands and Streams – Before dredged or fill material is placed in wetlands and streams, a permit must be obtained from the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act. As part of this permitting process, the State of Tennessee must determine whether the proposed action would violate state water quality standards. Alterations of streams also require an Aquatic Resource Alteration Permit (ARAP) issued by the State of Tennessee. Executive Order (EO) 11990 (Protection of Wetlands) directs federal agencies to avoid impacting wetlands to the extent practicable or to otherwise minimize potential wetland impacts.

Other Approvals

Floodplains – Under EO 11988 (Floodplain Management), federal agencies are directed to avoid affecting actions in floodplains to the extent practicable and to otherwise minimize potential impacts to floodplain values.

Endangered Species – Under the Endangered Species Act (ESA), federal agencies are to ensure that their actions are not likely to jeopardize the continued existence of any federally listed as endangered or threatened species or adversely modify any critical habitat of such species. If a proposed action may affect an endangered or threatened species, the agency must consult with the U.S. Fish and Wildlife Service (USFWS) and obtain that agency's determination of the potential for impacting these species. This EIS identifies endangered and threatened species known or likely to occur in the project area as well as their critical habitat and evaluates the potential effects on them.

Farmland Protection – Under the Farmland Protection Policy Act, federal agencies are required to identify and take into account potential adverse effects of a proposed action on farmlands. This EIS describes potential effects on prime farmlands.

Environmental Justice – EO 12898 directs some federal agencies to consider whether the effects of their actions would cause disproportionate burdens on the health or environment of any segment of the human population. While TVA is not subject to this executive order, this EIS includes a discussion of the potential effects of the alternatives on low income and minority populations in the project area.

Air Quality – Trees and other combustible materials removed during transmission line construction are often burned. This activity could require a permit issued by local authorities.

Transportation – A Section 10 Permit issued by the USACE under the Rivers and Harbor Act could be required for the Rutherford-Maury Transmission Line crossing the Harpeth River, a navigable stream.

1.8. Environmental Impact Statement Overview

The National Environmental Policy Act (NEPA) and its implementing regulations require an EIS to include specific kinds of information that agency officials will use in evaluating the environmental consequences of proposed actions. This EIS presents this information in a fairly standard format:

- Chapter 1 states the purpose and need of the proposed action and provides relevant background information.
- Chapter 2 describes alternative ways of accomplishing the proposed action as well as the No Action Alternative, summarizes the environmental impacts of each alternative, describes TVA's Preferred Alternative, and lists potential measures to mitigate environmental impacts.
- Chapter 3 describes the existing environment, including both natural and human resources, within the project area.
- Chapter 4 describes the anticipated effects of the alternative actions on the environmental resources within the project area.
- Chapters 5 and 7 present supporting information including a list of the preparers of this EIS and a list of references cited in text.
- Chapter 6 gives a list of agencies, organizations, and persons who received a copy of the EIS.
- Appendices provide detailed supporting information.
- An index is provided to help the reader easily locate key words in the EIS.